

# Young patient, ventricular tachycardia, magnetic resonance of the heart and myocarditis

Młody pacjent, częstoskurcz komorowy, rezonans magnetyczny serca  
i zapalenie mięśnia sercowego

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Należy cytować wersję pierwotną

## Abstract

Here, we describe the case of a 25-year-old patient, who reported to cardiac outpatients department due to palpitations. Patient had no history of chronic diseases. We described step-by-step the diagnostic process, which allowed us to find type and cause of arrhythmia and start out effective treatment.

Key words: ventricular tachycardia, myocarditis

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## Introduction

A 25-year-old physician reported to the cardiac outpatient clinic because of a feeling of heart palpitations. He was not treated for any chronic diseases and denied having cardiac conditions of any kind. He stated that about 7–10 days before the visit he had a runny nose, and had not used antibiotics. He did not report an increase in body temperature or chills. ECG exam showed sinus rhythm with numerous symptomatic single additional contractions of ventricular origin of RBBB morphology. 25 mg of metoprolol in morning and evening were prescribed. A 24-hour ECG Holter device was performed.

## No improvement — modification of treatment

The next day, due to the severity of symptoms and his weakness, the patient came to the hospitals admission room. The patient was in a stable condition, RR 130/88 mm Hg, HR 78/min. In ECG performed in the hospitals admission room, regular sinus rhythm was observed with 75/min. normal axis, PQ interval 140 ms. QRS complex 80 ms. Negative T-wave in lead III. Negative-positive T wave in aVF lead. Numerous single ExVs with RBBB morphology.

In performed echocardiography exam EF was 65%. Adequate left and right ventricular systolic function. No

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**Figure 1.** Periods of arrhythmia in Holter recording (marked in green): ventricular contractions and nsVT in 3-lead recording

additional echo findings or signs of fluid in the pericardium were revealed.

CBC, GFR, TSH results were found to be normal. Level of sodium, potassium, chloride were found to be within normal range, NT-proBNP 71.9 pg/mL, CRP 0.3 mg/L, troponin T hs – 7 ng/L. In chest X-ray no abnormal findings. Dental and ENT consultations were carried out, in which the presence of co-existing inflammatory foci were excluded. In serological testing, titres of anti-*Borrelia burgdorferi* antibodies in IgG and IgM classes were negative.

Holter ECG: normal sinus rhythm: 55–115/min during day time and 43–94/min at night, mean daily 69/min.

Numerous ExVs 5432/day, up to 870/h, arranged in periods of ventricular bigeminy and trigeminy, 647 ExV pairs, about 200 3–5 ExV salvos, 35 nsVT episodes of maximum duration up to 15 s with a maximum frequency of 219/min max QTc 480 ms. An example of a Holter recording is shown in Figure 1.

Due to the overall clinical picture, it was decided to change the antiarrhythmic treatment. 150 mg of propafenone twice daily was recommended. After a few days of therapy, symptoms have gotten better and the arrhythmia was stopped in resting ECG. Treatment with propafenone 300 mg/day with 24-hour Holter ECG monitoring was maintained.

### Searching for the cause of arrhythmia and further management

Due to the lack of structural heart disease and reversible causes of arrhythmia, it was decided to perform a magnetic resonance imaging of the heart in order to diagnose



**Figure 2.** Late contrast enhancement areas in magnetic resonance imaging

inflammatory background of the heart muscle. In a study performed about 20 days after the onset of the initial symptoms, normal left ventricular volume and global systolic function with EF 61%, without segmental contractility abnormalities and without myocardial hypertrophy were found. The right ventricular systolic function and size were normal. The study revealed subepicardial and intra-wall foci of late contrast enhancement in the basal and middle segments of the inferior wall and inferior part of the interventricular septum indicating inflammatory aetiology of the myocardium, without myocardial enema (inactive inflammatory process) (Figure 2). Due to the lack of features of active inflammatory process and quite limited area of inflammation, myocardial biopsy has been waived.

The patient had no complaints, he worked and functioned without restrictions. After 3 months, therapy with propafenone was completed and a 24-hour ECG Holter

exam was performed, in which the record was within the normal range and no signs of arrhythmia were documented (1 ExV/24 h).

## Discussion

Diagnosing myocarditis with the help of MRI imaging is a significant progress in cardiology. There is a broad spectrum of clinical manifestations of acute myocarditis, from asymptomatic course to acute heart failure. Viral aetiology of myocarditis is the most common in patients from developed countries [1]. This case shows that a trivial upper respiratory tract infection in a young patient without a structural heart disease could have dramatic consequences in the form of sudden cardiac death (numerous nsVT). The patient was not qualified for myocardial biopsy due to improvement and clinical stabilization after pharmacotherapy as well as rather limited area of late contrast enhancement and inactive inflammatory process traits in MRI. It is worth recalling that the mechanism of life-threatening arrhythmias in the course of myocarditis is associated with myocardial cell structure damage (possible growth of myocardial necrosis markers in the blood), which in further observation may

result in fibrosis and disorders of the cardiac conduction system [1].

## Summary

In summary, the occurrence of life-threatening ventricular arrhythmias in young people is a serious clinical challenge. The first symptom may be sudden cardiac death. An important role in the prevention of acute myocarditis in the course of viral infections should be played by the proper treatment of infections, education of the patient in the office of the primary care physician about possible complications of seemingly trivial infections and recommendations for flu vaccination. Highly specialized MRI diagnostics provides valuable information on the presence of inflammatory process in the myocardium, its activity, extent and possible complications in the form of deteriorated contractility of LV. Myocardial resonance is an important element of the diagnostic process of myocarditis and the further decision of performing biopsy [2].

## Conflict(s) of interest

The authors declare no conflict of interest.

## Streszczenie

Przedstawiono przypadek młodego 25-letniego pacjenta, który zgłosił się do poradni kardiologicznej z powodu uczucia kołatania serca w klatce piersiowej. Pacjent wcześniej nie leczył się przewlekłe. Opisano, krok po kroku, proces diagnostyczny pozwalający ustalić rodzaj odczuwanej arytmii, przyczynę oraz skuteczne leczenie pacjenta.

Słowa kluczowe: częstoskurcz komorowy, zapalenie mięśnia sercowego

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